

What is claimed is :

1. A method of implementing at least one of recording and transmitting digital data, under conditions that a total code length including data and error correcting codes corresponds to not less than 256 symbols, and each of said symbols comprises n-bits , where n is larger than 8.

2. The method as claimed in claim 1, further comprising the steps of :

arraying said data and said error correcting codes in a matrix of plural rows and plural columns ;

calculating external code error correcting codes for all column-directional alignments of data in a column direction, and further internal code error correcting codes for all row-directional alignments of data in a column direction or the external code error correcting codes ; and

recording the data and the calculated external and internal code error correcting codes.

3. The method as claimed in claim 1, wherein said error correcting codes are Reed-Solomon codes over GF (2^n).

4. The method as claimed in claim 1, wherein said data are arrayed in a matrix of plural rows and plural columns, and a total data length corresponds to a number of symbols, which is equal to or multiply of 2064.

5. The method as claimed in claim 1, wherein said data are arrayed in a matrix of plural rows and plural columns, and a total data length corresponds to a number of symbols which is equal to or multiply of
5 33024.

6. The method as claimed in claim 1, wherein said data are arrayed in a matrix of plural rows and plural columns, and a total data length of the rows corresponds to a number of symbols which is equal to or multiply of
10 192.

7. The method as claimed in claim 1, wherein said data are arrayed in a matrix of plural rows and plural columns, and a total data length of the columns corresponds to a number of symbols which is equal to or multiply
15 of 172.

8. The method as claimed in claim 2, wherein external code error correcting codes are isolated into a first block comprising even number rows and a second block comprising odd number rows.

9. The method as claimed in claim 8, wherein calculations of said external code error correcting codes are made with a row-directional increment of 2 or more integer.

10. The method as claimed in claim 1, wherein calculations of said error correcting codes are made with a second column-directional increment of 2 or more integer.

5 11. The method as claimed in claim 1, further comprising the steps of :

arraying said data and said error correcting codes in a matrix array of plural rows and plural columns ;

10 dividing said data and said error correcting codes into a plurality of sectors ; and

adding at least an additional information to each of said sectors to form each logic segment.

15 12. The method as claimed in claim 11, wherein said each segment has a segment size of 2048 bytes.

13. The method as claimed in claim 11, wherein said each segment has a segment size of 2064 bytes, which comprises 2048 bytes for data and 16 bytes for segment header.

20 14. The method as claimed in claim 11, wherein each external code error correcting code is placed following to an end of said each sector.

15. The method as claimed in claim 11, wherein each external code

error correcting code is placed on a center region of said matrix array.

16. The method as claimed in claim 15, wherein a length of said each symbol is equal to a bit length of coded data.

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17. A method of preparing a table including at least data and error correcting codes, wherein a total code length including said data and said error correcting codes corresponds to not less than 256 symbols, and each of said symbols comprises n-bits , where n is larger than 8.

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18. The method as claimed in claim 17, further comprising the steps of :

arraying said data and said error correcting codes in a matrix of plural rows and plural columns ; and

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calculating external code error correcting codes for all column-directional alignments of data in a column direction, and further internal code error correcting codes for all row-directional alignments of data in a column direction or the external code error correcting codes.

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19. The method as claimed in claim 17, wherein said error correcting codes are Reed-Solomon codes over GF (2^n).

20. The method as claimed in claim 17, wherein said data are arrayed in a matrix of plural rows and plural columns, and a total data

length corresponds to a number of symbols, which is equal to or multiply of 2064.

21. The method as claimed in claim 17, wherein said data are
5 arrayed in a matrix of plural rows and plural columns, and a total data
length corresponds to a number of symbols which is equal to or multiply of
33024.

22. The method as claimed in claim 17, wherein said data are arrayed
10 in a matrix of plural rows and plural columns, and a total data length of the
rows corresponds to a number of symbols which is equal to or multiply of
192.

23. The method as claimed in claim 17, wherein said data are arrayed
15 in a matrix of plural rows and plural columns, and a total data length of the
columns corresponds to a number of symbols which is equal to or multiply
of 172.

24. The method as claimed in claim 18, wherein external code error
20 correcting codes are isolated into a first block comprising even number
rows and a second block comprising odd number rows.

25. The method as claimed in claim 24, wherein calculations of said
external code error correcting codes are made with a row-directional

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increment of 2 or more integer.

26. The method as claimed in claim 17, wherein calculations of said error correcting codes are made with a second column-directional
5 increment of 2 or more integer.

27. The method as claimed in claim 17, further comprising the steps of :

arraying said data and said error correcting codes in a matrix
10 array of plural rows and plural columns ;

dividing said data and said error correcting codes into a plurality
of sectors ; and

adding at least an additional information to each of said sectors to
form each logic segment.

28. The method as claimed in claim 27, wherein said each segment
has a segment size of 2048 bytes.

29. The method as claimed in claim 27, wherein said each segment
20 has a segment size of 2064 bytes, which comprises 2048 bytes for data and
16 bytes for segment header.

30. The method as claimed in claim 27, wherein each external code
error correcting code is placed following to an end of said each sector.

31. The method as claimed in claim 27, wherein each external code error correcting code is placed on a center region of said matrix array.

5 32. The method as claimed in claim 15, wherein a length of said each symbol is equal to a bit length of coded data.

33. A table including at least data and error correcting codes, wherein a total code length including said data and said error correcting codes corresponds to not less than 256 symbols, and each of said symbols comprises n-bits, where n is larger than 8.

34. The table as claimed in claim 33, wherein said table comprises a matrix array of said data and said error correcting codes over plural rows and plural columns ; and said error correcting codes includes external code error correcting codes for all column-directional alignments of data in a column direction, and internal code error correcting codes for either one of all row-directional alignments of data in a column direction or the external code error correcting codes.

35. The table as claimed in claim 33, wherein said error correcting codes are Reed-Solomon codes over $GF(2^n)$.

36. The table as claimed in claim 33, wherein said table has a data

array of plural rows and plural columns, and a total data length corresponds to a number of symbols, which is equal to or multiply of 2064.

37. The table as claimed in claim 33, wherein said table has a data array of plural rows and plural columns, and a total data length corresponds to a number of symbols which is equal to or multiply of 33024.

38. The table as claimed in claim 33, wherein said table has a data array of plural rows and plural columns, and a total data length of the rows corresponds to a number of symbols which is equal to or multiply of 192.

39. The table as claimed in claim 33, wherein said table has a data array of plural rows and plural columns, and a total data length of the columns corresponds to a number of symbols which is equal to or multiply of 172.

40. The table as claimed in claim 34, wherein external code error correcting codes are isolated into a first block comprising even number rows and a second block comprising odd number rows.

41. The table as claimed in claim 33, wherein said table has a matrix array comprising said data and said error correcting codes over plural rows and plural columns, and said matrix array has a plurality of logic segments, and each of said logic segments includes each sector and an additional

information, and said each sector including at least one of said data and said error correcting codes.

42. The table as claimed in claim 41, wherein said each segment has
5 a segment size of 2048 bytes.

43. The table as claimed in claim 41, wherein said each segment has
a segment size of 2064 bytes, which comprises 2048 bytes for data and 16
bytes for segment header.

44. The table as claimed in claim 41, wherein each external code
error correcting code is positioned following to an end of said each sector.

45. The table as claimed in claim 41, wherein each external code
15 error correcting code is positioned on a center region of said matrix array.

46. The table as claimed in claim 45, wherein a length of said each
symbol is equal to a bit length of coded data.

20 47. The table as claimed in claim 33, wherein said table comprises an
error correcting code block table.

48. The table as claimed in claim 33, wherein said table has a size
larger than 256x256 arrays of symbols.

49. A system for recording and transmitting digital data, wherein said system includes a table as claimed in claim 33.

5 50. A method of using a table as claimed in claim 33.

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